

Remarks

Claims 1-16, 34-44, 46, and 47 were pending in the present application at the time of the Office Action, and of those claims 1-16 have been withdrawn from consideration (with traverse). Claims 34-44 and 46 were rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 5,955,213 to Yano et al. (Yano). The Applicant also thanks the Examiner for remarking that allowable subject matter is recited in claim 47. The Applicant has amended certain claims and, in light of these amendments and the discussion herein, respectfully requests reconsideration of the application as amended.

As shown above, claim 34 has been amended to recite (among other limitations) “a single crystalline substrate having a crystal face selected from the group consisting of a YSZ single crystal (100) face, a YSZ single crystal (111) face, a 3C-SiC single crystal (100) face, a CaF₂ single crystal (100) face, a MgO single crystal (100) face, a 6H-SiC single crystal (0001) face and a ZnO (0001) face.” This structure is supported at page 7 of the original application, and recites elements neither shown nor suggested in the single cited reference Yano.

For example, Yano neither shows nor suggests any of the crystal faces in the Markush group recited in claim 34. The crystal structure of each recited face in the group tends to have very good matching ability with ITO, which facilitates heteroepitaxial growth of the ITO thin film on the substrate.

Claims 35, 36, and 40-43 depend from claim 34, and are novel over Yano for at least the same reasons. Further, the Applicant notes that not all of the limitations recited in the dependent claims are shown by the cited reference. For example, claim 42 recites that “ITO thin film is formed on said substrate which has a temperature between about

500 and about 1000 °C by a pulsed laser deposition method,” which is not taught by Yano. Because these limitations are missing from the dependent claims (as amended), reconsideration of them is requested.

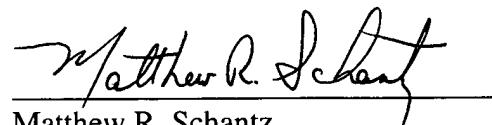
Claim 37 recites, among other things, a low resistance ITO thin film “deposited on a c-axis-oriented ZnO film … by epitaxial growth.” This feature is neither shown nor suggested in Yano, as implicitly acknowledged in the Office Action by the indication of allowable subject matter in claim 47. Furthermore, the effect of the non-matching crystal lattices of the substrate and ITO thin film can be reduced by providing a ZnO thin film between them. In some embodiments, the low resistance ITO thin film has desirable resistivity characteristics and can be manufactured with a high degree of reproducibility.

New claim 49 is supported at least by the disclosure on and after page 10 of the original patent application and recites (among other things) a “low resistance ITO thin film … deposited on a c-axis-oriented ZnO film”, which was recited in claim 47 (indicated by the Examiner to be allowable, at least when it depended from claim 37). New claim 49 also recites that the film is “provided on a glass substrate.”

Applicant notes that all reasons supporting the novelty and non-obviousness of each claim apply as well to the claims depending therefrom. Applicant asserts those reasons accordingly.

Applicant has amended six (6) claims, cancelled one (1) claim, and added one (1) claim. Reconsideration of the application and timely allowance of pending claims 34-44, 46 and 49 is respectfully requested. The undersigned welcomes a telephonic interview with the Examiner if the Examiner believes that such an interview would facilitate review of this Amendment and Response.

Respectfully submitted,



Matthew R. Schantz
Reg. No. 40,800
Woodard, Emhardt, Moriarty,
McNett and Henry LLP
111 Monument Circle, Suite 3700
Indianapolis, Indiana 46204
Phone: (317) 634-3456
Fax: (317) 637-7561